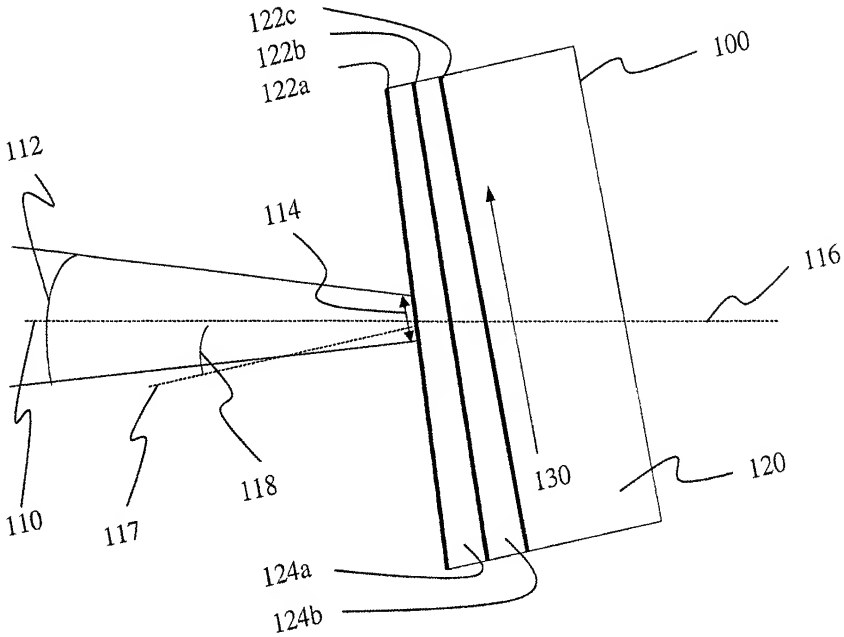

Fig. 1

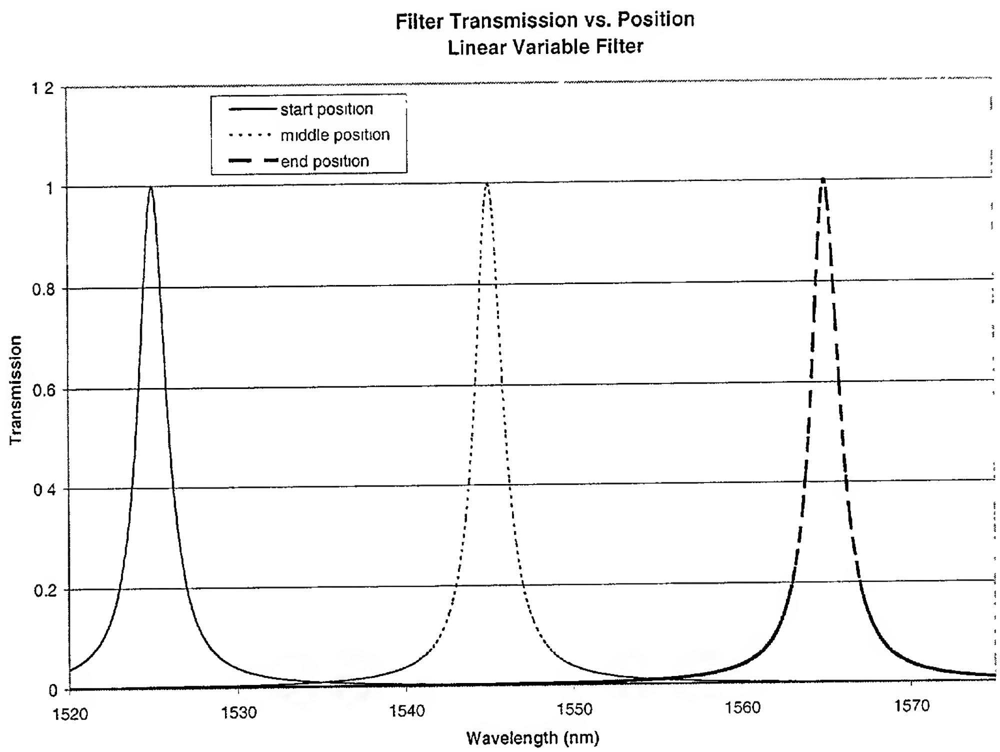
Filter Transmission vs. Position
Linear Variable Filter
start position
middle position
end position
Transmission
1 2
1
0.8
0.6
0 4
0.2
0
1520
1530
1540
1550
1560
1570
Wavelength (nm)

Fig. 2

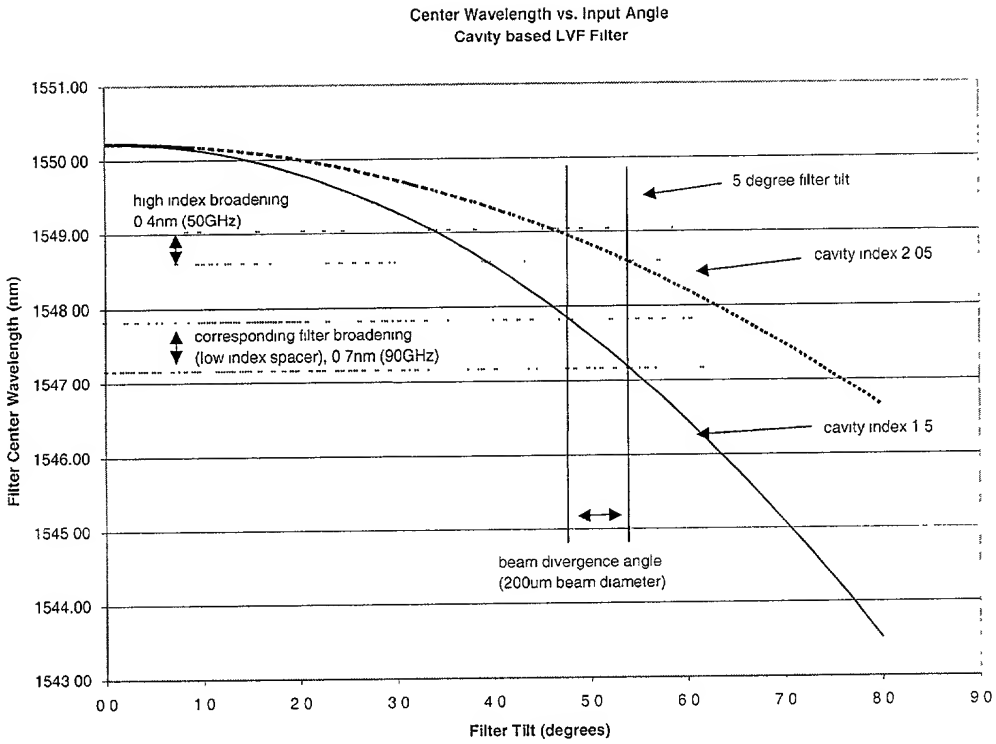
Center Wavelength vs. Input Angle
Cavity based LVF Filter
1551.00
1550 00
1549.00
1548 00
1547 00
1546.00
1545 00
1544.00
1543 00
Filter Center Wavelength (nm)
high index broadening
0 4nm (50GHz)
corresponding filter broadening
(low index spacer), 0 7nm (90GHz)
5 degree filter tilt
cavity index 2 05
cavity index 1 5
beam divergence angle
(200um beam diameter)
00
10
20
30
40
50
60
70
80
90
Filter Tilt (degrees)

Fig. 3

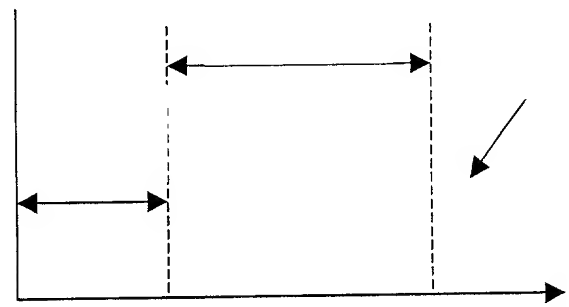

Fig. 4

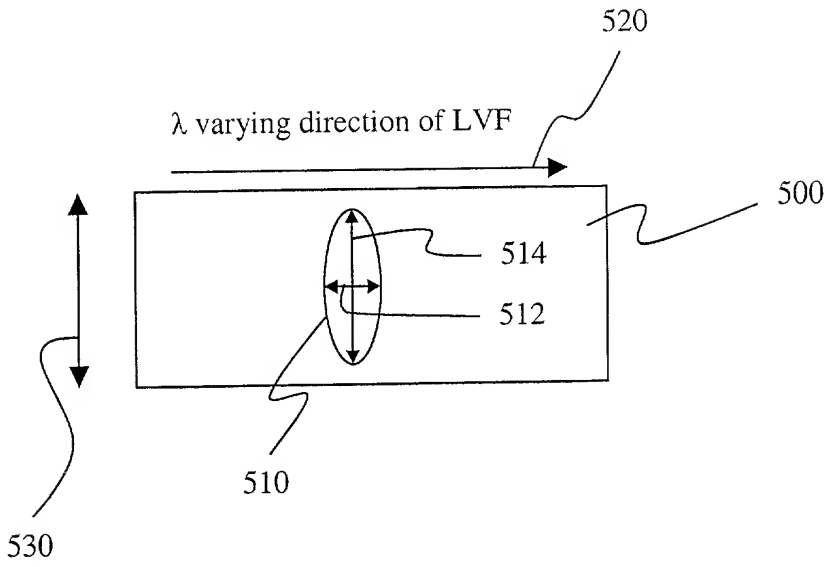

Fig. 5

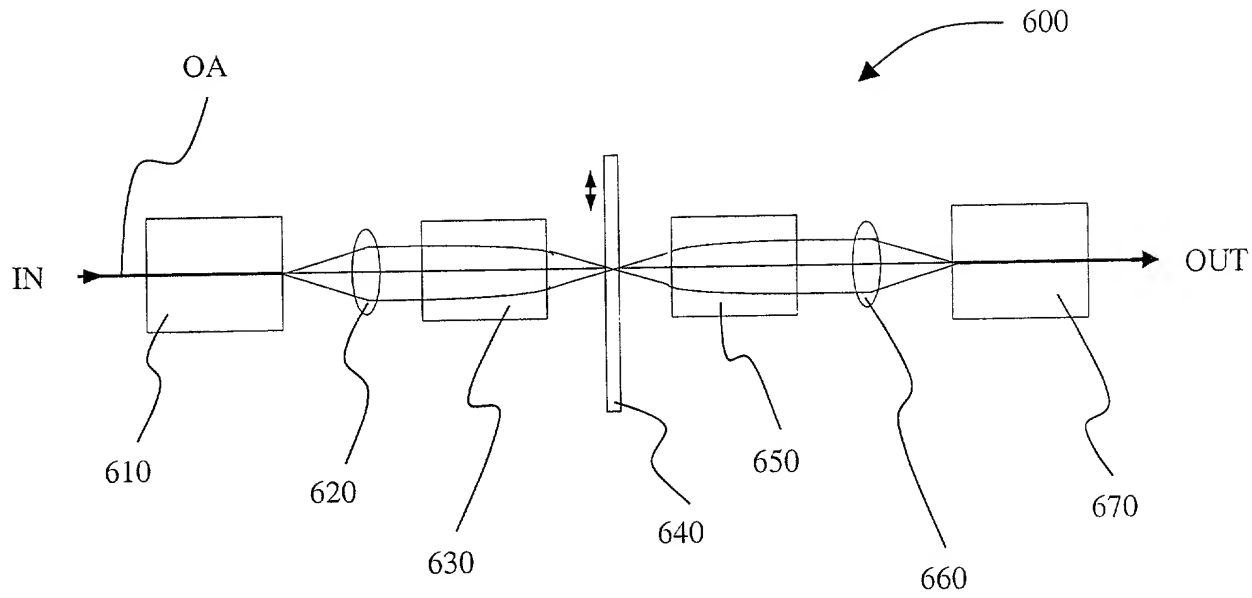
600
OA
IN
OUT
610
620
630
640
650
660
670

Fig. 6a

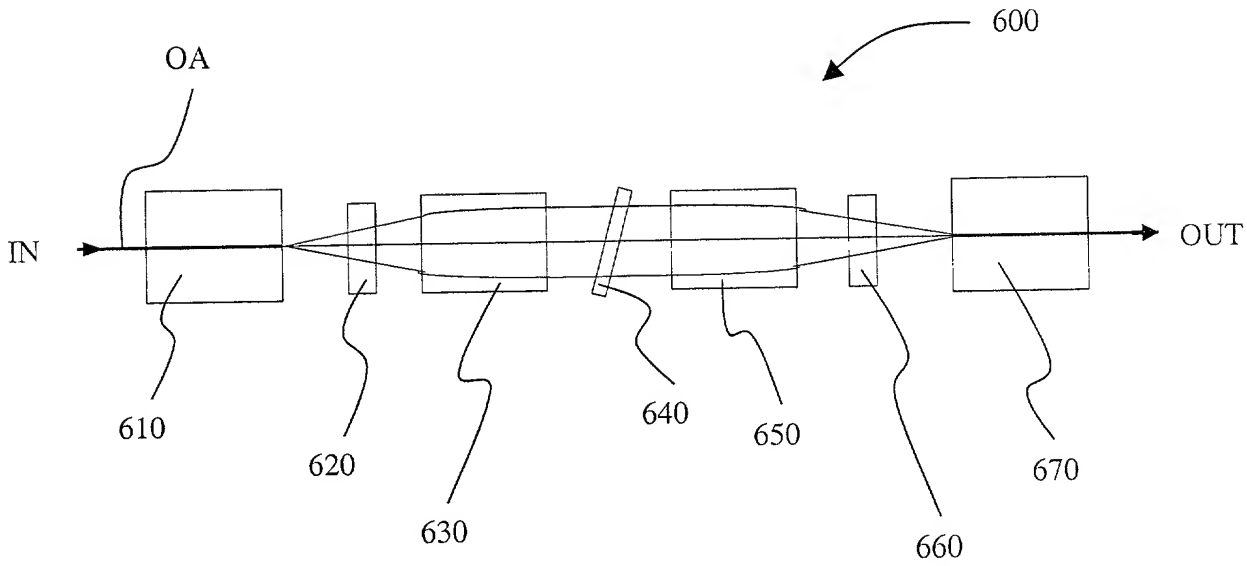
600
OA
IN
OUT
610
620
630
640
650
660
670

Fig. 6b

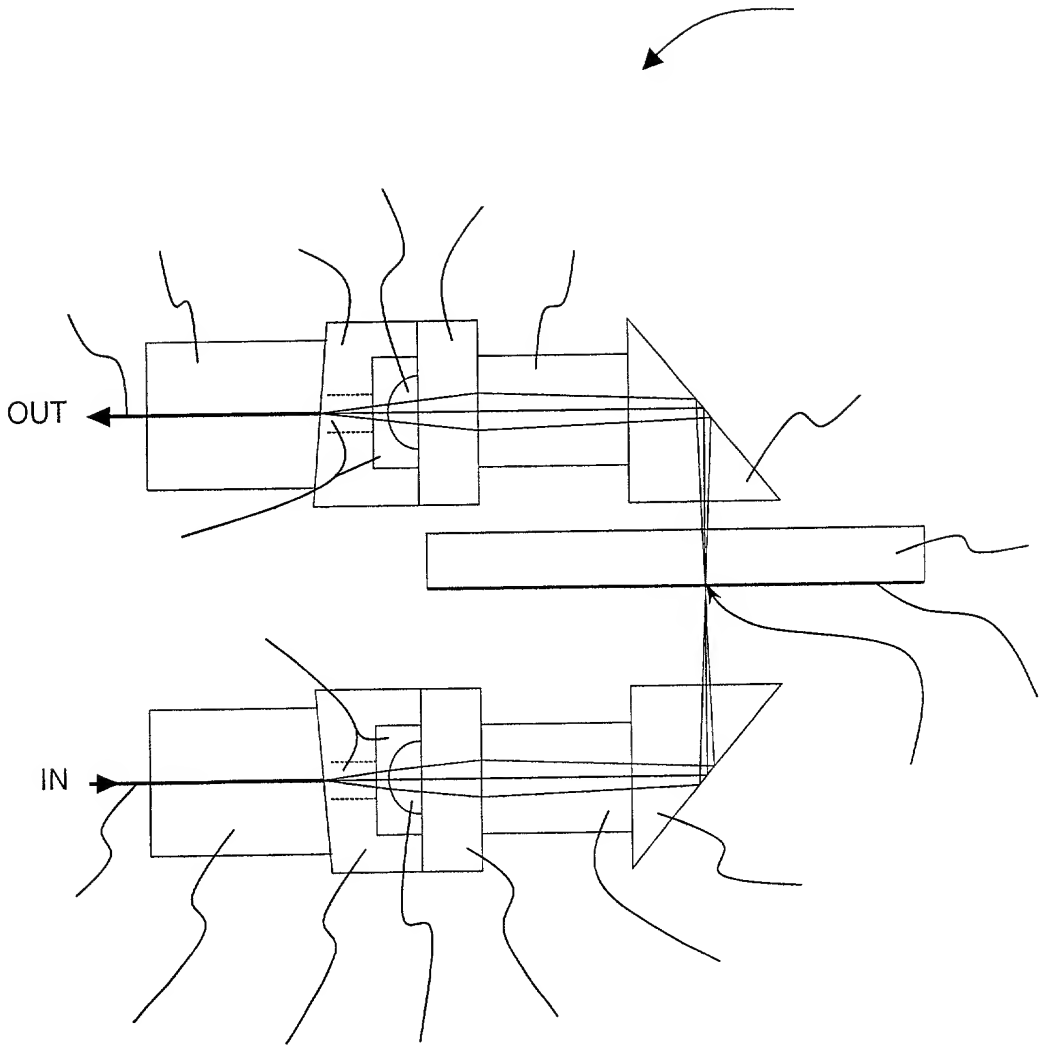

Fig. 7

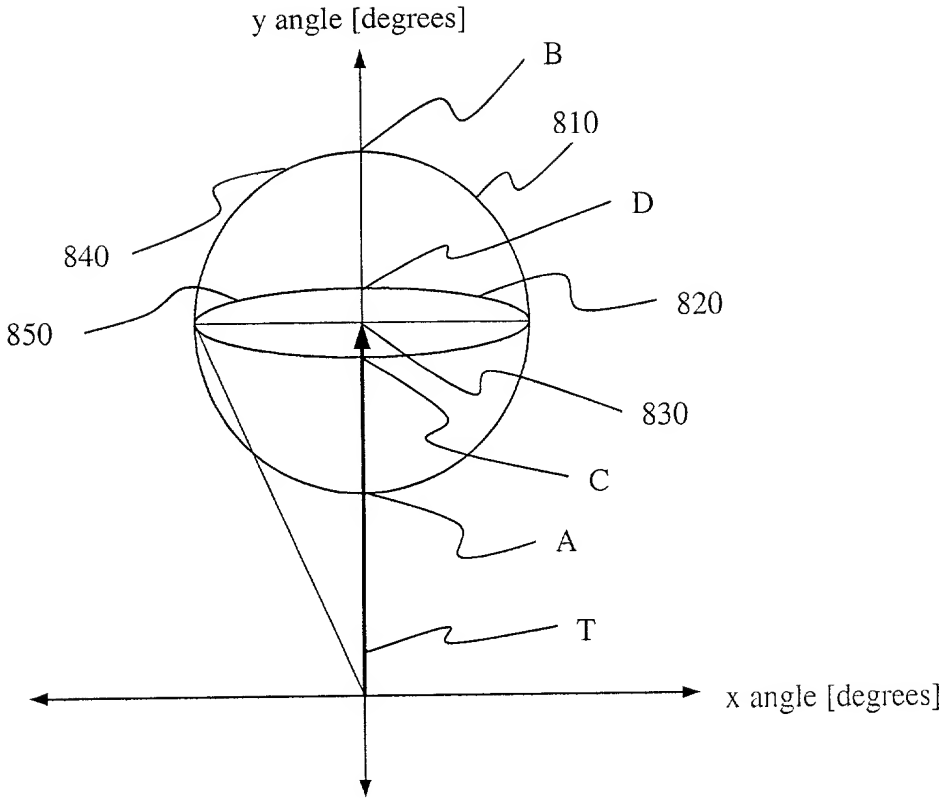

Fig. 8

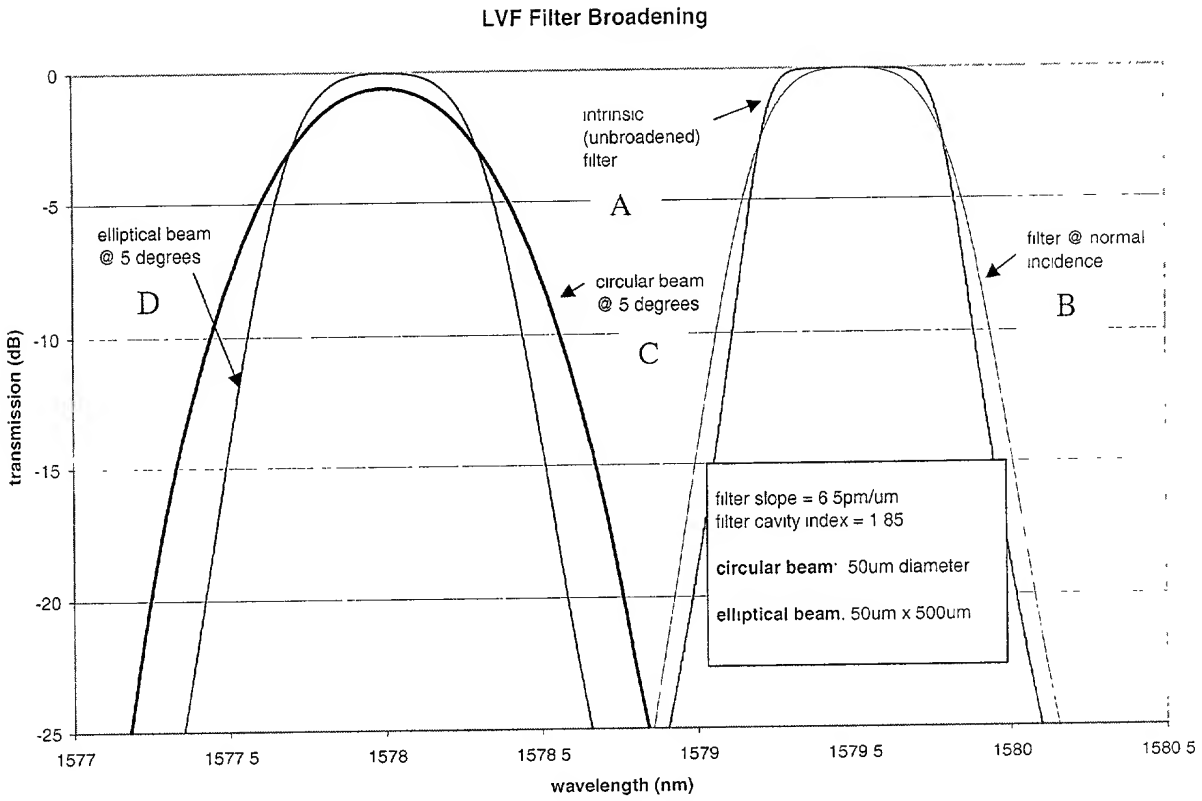
LVF Filter Broadening
0
-5
-10
-15
-20
-25
transmission (dB)
1577
1577 5
1578
1578 5
1579
1579 5
1580
1580 5
wavelength (nm)
intrinsic
(unbroadened)
filter
A
elliptical beam
@ 5 degrees
D
circular beam
@ 5 degrees
C
filter @ normal
incidence
B
filter slope = 6 5pm/um
filter cavity index = 1 85
circular beam 50um diameter
elliptical beam. 50um x 500um

Fig. 9

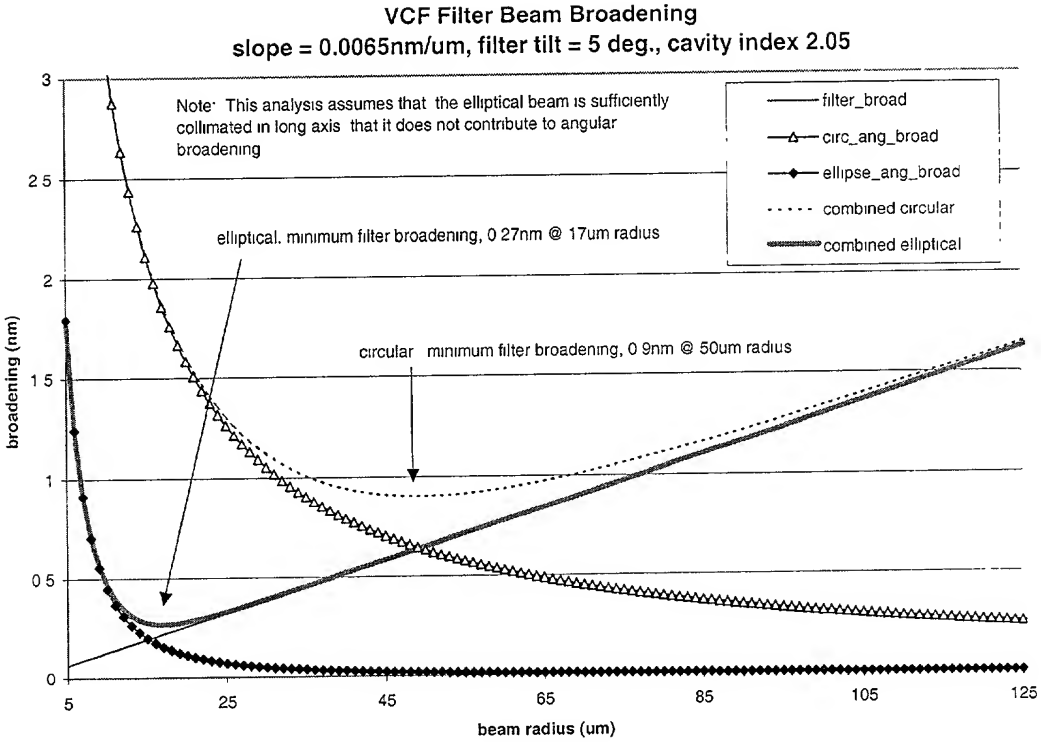
VCF Filter Beam Broadening
slope = 0.0065nm/um, filter tilt = 5 deg., cavity index 2.05
Note: This analysis assumes that the elliptical beam is sufficiently collimated in long axis that it does not contribute to angular broadening
elliptical, minimum filter broadening, 0.27nm @ 17um radius
circular minimum filter broadening, 0.9nm @ 50um radius
filter_broad
circ_ang_broad
ellipse_ang_broad
combined circular
combined elliptical
broadening (nm)
beam radius (um)
3
2.5
2
1.5
1
0.5
0
5
25
45
65
85
105
125

Fig. 10

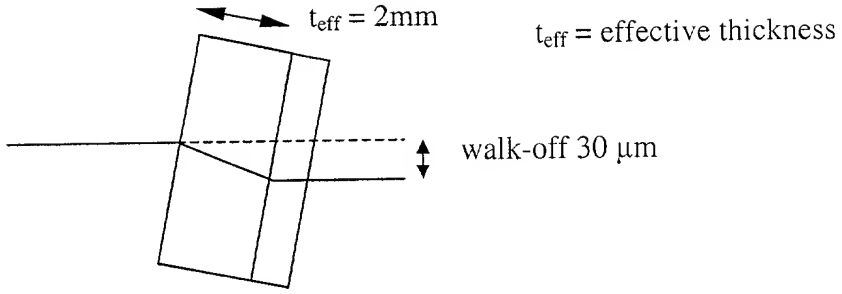

Fig. 11

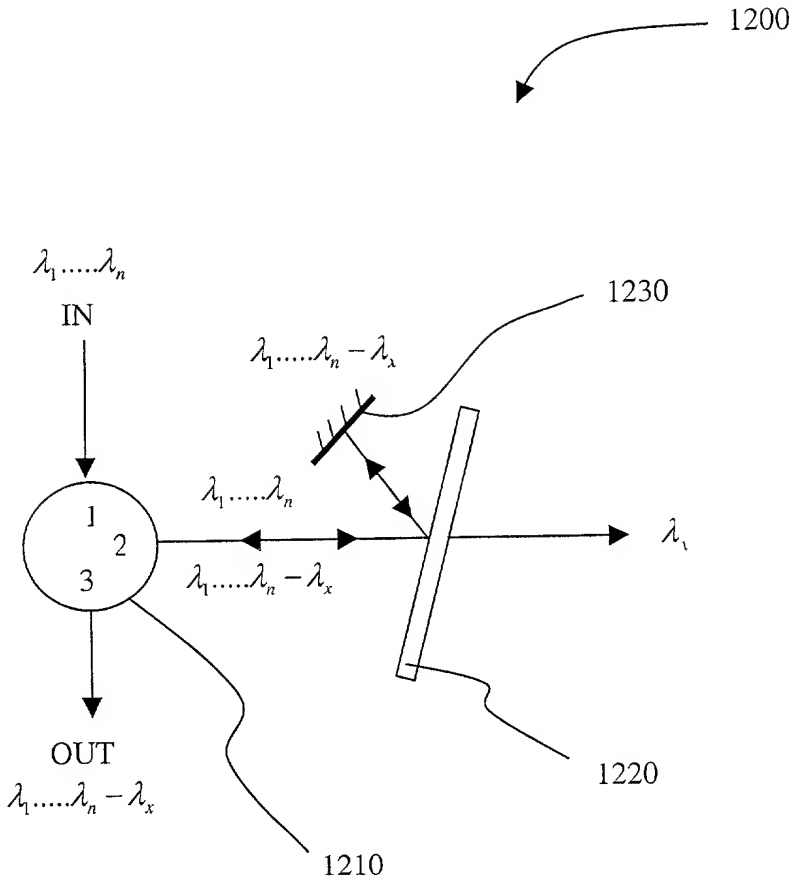
1200
$\lambda_1 \ldots\ldots \lambda_n$
IN
1230
$\lambda_1 \ldots\ldots \lambda_n - \lambda_x$
$\lambda_1 \ldots\ldots \lambda_n$
1
2
3
$\lambda_1 \ldots\ldots \lambda_n - \lambda_x$
λ_x
OUT
$\lambda_1 \ldots\ldots \lambda_n - \lambda_x$
1220
1210

Fig. 12

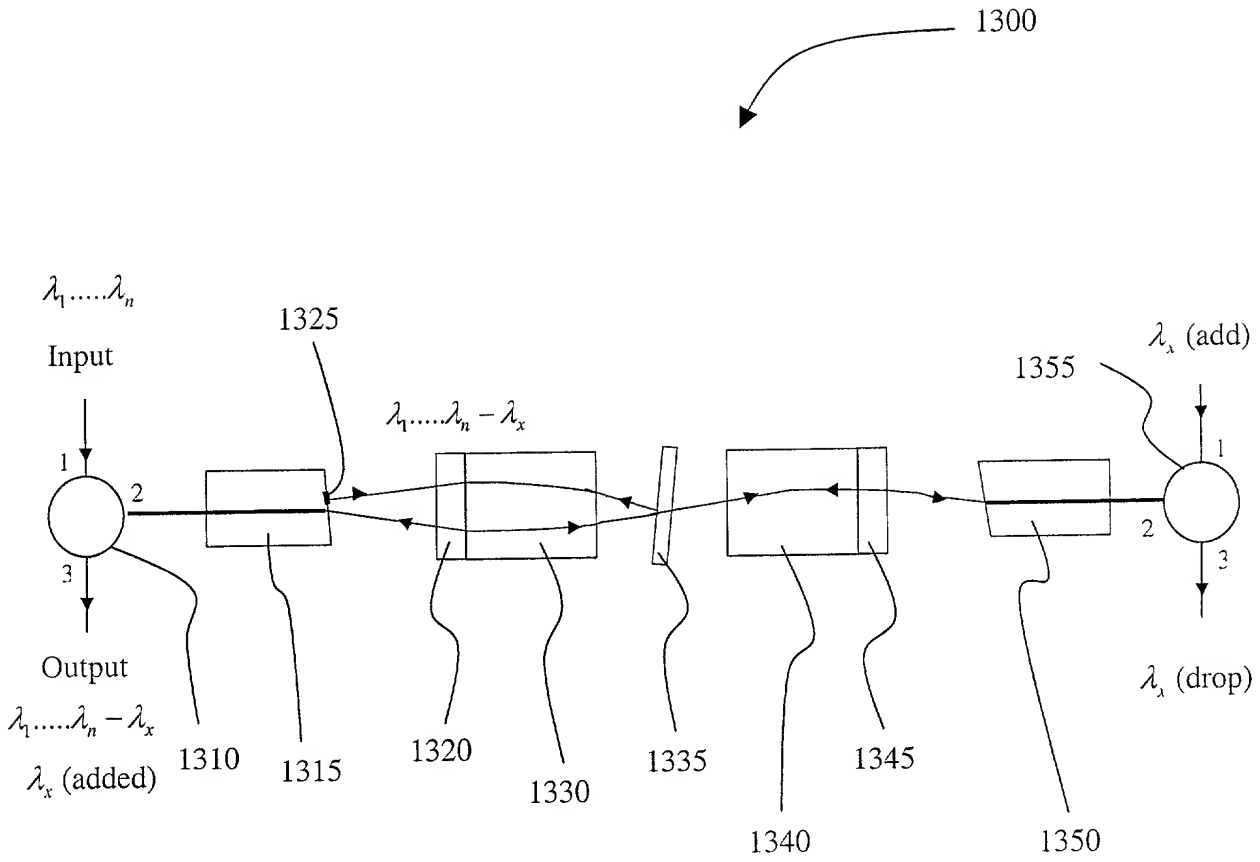
1300
$\lambda_1 ..... \lambda_n$
Input
1325
$\lambda_1 ..... \lambda_n - \lambda_x$
λ_x (add)
1355
1
2
3
Output
$\lambda_1 ..... \lambda_n - \lambda_x$
λ_x (added)
1310
1315
1320
1330
1335
1340
1345
1350
λ_x (drop)

Fig. 13